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AUTHOR	Ysseldyke, James E.; And Others
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ABSTRACT

Observations were conducted to document the active academic responding and academic engagement rates of 122 elementary students (30 learning-disabled, 32 emotionally/behaviorally disturbed, 30 mildly mentally retarded, and 30 self-contained programs. Data were recorded in 10-second intervals for each student over an entire school day. During a typical school day, the average amount of academic engaged time across groups was a little over 2 hours, about 57% of the time they were observed. The average amount of active academic responding time was a little over 1 hour, about 28% of observed time. Management responses (such as raising hand, looking for materials, and waiting) accounted for a significant portion of the student's day, and inappropriate responses accounted for about 30 minutes. Over the entire school day, there were no significant differences in the array of responses made by the different categories of students. In general, students in special education settings spent more time actively engaged in academic responses than mainstreamed students did; inappropriate and management responses were higher in mainstream settings. (Author/JDD)

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University of Minnesota

RESEARCH REPORT NO. 4

ACADEMIC ENGAGEMENT AND ACTIVE RESPONDING OF MENTALLY RETARDED, LEARNING DISABLED, EMOTIONALLY DISTURBED AND NONHANDICAPPED ELEMENTARY STUDENTS

James E. Ysseldyke, Sandra L. Christenson,
Martha L. Thurlow, and Russell Skiba

INSTRUCTIONAL ALTERNATIVES PROJECT

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Abstract

Observations were conducted to document the active academic responding and academic engagement rates of 30 LD, 32 EBD, 30 EMR and 30 nonhandicapped elementary students. Data were recorded in 10-second intervals for each student over an entire school day. Handicapped students were observed in both mainstream and special education settings, and their active responding and engagement rates were examined as a function of setting. There were few differences among categories in responding and engagement rates, but several differences between the two settings. In general, students spent more time actively engaged in academic responses in special education settings; inappropriate and management responses were higher in mainstream settings. Implications for instruction and educational policy are discussed.

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Academic Engagement and Active Responding of Mentally Retarded, Learning Disabled, Emotionally Disturbed and Nonhandicapped Elementary Students in Regular and Special Education Settings

There are large differences between time allocated to instruction and the amount of time students are engaged in learning (Anderson, 1984; Karweit, 1983), or in actively making academic responses (Graden, Thurlow, & Ysseldyke, 1983a; Greenwood, Delquadri, & Hall, 1984; Thurlow, Graden, Ysseldyke, & Algozzine, 1984). Ysseldyke and his colleagues (see Graden et al., 1983a) found that the active academic responding times of elementary students in both regular education and special education averaged about 45 minutes each school day, or approximately 25% of total student responding time ("responding time" occurs during about one half of the school day because of breaks for lunch, gym, recess, and other noncodable events). Nearly 50% of responding time involved "task management responses," such as looking for materials, waiting, or raising hands. Students responded with inappropriate behaviors for 25% of their total responding time.

Zigmond, Vallecorsa, and Leinhardt (1980) reported engaged time rates for LD students within a special class that appeared to be higher than the rates reported by Graden et al. (1983). The students in Zigmond's study spent only one third of their day in management and off-task behaviors. While these findings suggest that students' engaged time rates may be higher in special education settings, the differences also may be due to the distinction between active academic responding time and academic engaged time. The former excludes merely attending to the assigned task; attending must be accompanied by an active academic response.

To date, we do not have good information on handicapped students' academic engagement and active responding in regular education versus special education settings. Yet, a basic premise of special education services is that special education provides the handicapped student with something "extra" that cannot be obtained in the regular education setting. A basic reflection of that "extra" should be increased student engagement and academic responding, especially since these are related to student achievement (Fisher, Berliner, Filby, Marliave, Cahen, & Dishaw, 1980; Karweit, 1983). Earlier efforts to compare student responding in special education and regular education (Thurlow, Ysseldyke, Graden, & Algozzine, 1983) were hampered by methodological difficulties arising from the manner in which students were served.

Related to the issue of how students respond in regular education and special education settings is the issue of the categorical designations assigned to students. It is assumed that mildly handicapped students with different categorical labels have different instructional needs. It is also assumed that they respond differently to the instruction they receive. Since academic engagement rates and active responding rates are important indexes of what students are doing in the classroom, it is important to ask about the extent to which differences appear among mildly handicapped students with different labels. Other research has indicated that there are few differences in time allocated to instruction in different content areas (Ysseldyke, Thurlow, Christenson, & Weiss, in press), the kinds

of tasks used (Ysseldyke, Christenson, Thurlow, & Bakewell, 1987), or instructional grouping arrangements (Ysseldyke, Thurlow, Christenson, & McVicar, 1987) as a function of category. If differences are not found in the nature of students' responses, additional major questions are raised about current categorical practices used with mildly handicapped students.

This study was conducted to document the nature of responding of handicapped and nonhandicapped students during a typical school day. In addition, the responses of handicapped students were examined in mainstream and special education settings. Specifically, the following research questions were addressed:

- To what extent are there differences in responses for learning disabled (LD), emotionally/behaviorally disturbed (EBD), educable mentally retarded (EMR), and nonhandicapped (NH) students?
- To what extent are there differences in the percentage of time spent in various responses by students with different handicap labels in different settings (mainstream, special education)?

For each of these questions, the primary responses of interest were active academic responses, academic engaged time responses, management responses, and inappropriate responses. In addition, 10 specific responses were examined because of the frequency with which they occurred or because of their theoretical interest. These specific responses included three active responses (writing, reading silently, reading aloud), three management responses (attending, waiting, looking for materials), and four inappropriate responses (looking around, inappropriate task, inappropriate locale, disruption).

Method

Subjects

Subjects were 92 school-identified handicapped students (30 LD, 32 EBD, 30 EMR) and 30 nonhandicapped students (NH) in grades 2-4 in one large urban and one suburban school district. Regular education students in this study included only those students who received no extra services, such as Chapter I or High Potential. Seventy students (57%; 50 handicapped, 20 nonhandicapped) were from the suburban district and 52 (43%; 42 handicapped, 10 nonhandicapped) were from the urban district.

All handicapped subjects were school identified; their labels were verified by the special education teachers. Identification of LD students presented no problem in either district. Due to the noncategorical approach of one of the districts, however, specific behavioral descriptors were used to confirm the school identification of EBD and EMR students. EBD students were described as students who had chronic task incompletion problems, acting out, behavior difficulties, or social interaction difficulties; any of the three characteristics were to be severe enough to impede academic performance. EMR students were described as students who are functionally academically retarded in all four basic skill areas. Most of the students received their basic skill instruction within special education settings.

Demographic data. Grade, sex, and race data for the subjects are listed in Table 1. Students ranged in age from 91 to 146 months; the

Table 1

Student Demographic Information Breakdown by Category[a]

	Category[b]			
	LD	EBD	EMR	NH
Grade				
2	11 (36.7%)	8 (25.0%)	10 (33.3%)	7 (23.3%)
3	8 (26.7%)	12 (37.5%)	7 (23.3%)	11 (36.7%)
4[c]	11 (36.7%)	12 (37.5%)	13 (43.3%)	12 (40.0%)
Sex				
Male	20 (66.7%)	22 (68.8%)	13 (43.3%)	12 (40.0%)
Female	10 (33.3%)	10 (31.3%)	17 (56.7%)	18 (60.0%)
Race				
Caucasian	21 (70.0%)	20 (62.5%)	20 (66.7%)	27 (90.0%)
Black	8 (26.7%)	12 (37.5%)	7 (23.3%)	2 (6.7%)
Asian	1 (3.3%)	---	2 (6.7%)	---
Hispanic	---	---	---	---
Native American	---	---	1 (3.3%)	---
Other	---	---	---	1 (3.3%)

[a]Entries are frequencies, with percentages in parentheses

[b]Categories are LD = learning disabled, EBD = emotionally/behaviorally disturbed, EMR = educable mentally retarded, NH = nonhandicapped

[c]One EMR student was a 5th grader in a 4/5 split grade class

handicapped students, on the average, were slightly older. The average for LD students was 113 months (range = 91-136 months); the average age for EBD students was 115 months (range = 97-137 months); the average age for EMR students was 119 months (range = 99-146 months); and the average age for nonhandicapped students was 109 months (range = 91-128 months).

Teacher characteristics. Participating teachers included 24 special education teachers and 51 regular education teachers. The mean number years teaching experience was 16.6 years (range = 1-31 years). Most teachers were female (n = 66; 88.0%); nine teachers (12%) were male. The majority of teachers held bachelor degrees plus additional credits (n = 32; 42.7%), master's degrees (n = 24; 32.0%) or master's degree plus additional credits (n = 10, 13.3%). Nine teachers (12%) held a bachelor's degree only.

Subject selection. Teachers and students were volunteer participants in the study. Students were randomly selected within category with two restrictions: (a) parent permission for student participation had been obtained, and (b) no mainstream teacher would have more than two students and no special education teacher would have more than four students involved in the study unless willing to do so. (It became necessary for EBD teachers to have more than four students involved because fewer of these teachers were employed in the districts and because greater difficulties were encountered in obtaining parent permission for EBD students in some classes.)

Observation System

A modified version of the CISSAR (Code for Instructional Structure and Student Academic Response) observation system was used in this study. The CISSAR system was developed by the Juniper Gardens Children's Project in Kansas City, Kansas (Greenwood, Delquadri, & Hall, 1978), to focus on the behavior of one target student. In the original system, 19 student response codes were defined. These were combined to form three composite variables: active academic responses, task management responses, and inappropriate responses. In this study, one of the inappropriate responses (self-stimulation) was deleted and another task management response (waiting) was added. "Waiting" was defined as time when the student is not involved in any response and the situation involves an obvious "wait" time such as when the student is in line, teacher stops lecture to answer telephone, etc. (see Stanley & Greenwood for definitions of other student response codes). The decision to make this change was based on previous observational studies, which found minimal self-stimulation behavior, but a great deal of waiting time.

A momentary time sampling technique was used to direct the recording of events. The response made by the target student was recorded every 10 seconds over the entire school day. An auditory electronic timer attached to a clipboard was used to signal the 10-second intervals. The timer was equipped with an earplug so that only the observer could hear the signal (a short beep sound). Coding sheets were modeled after those used by the Juniper Gardens Children's Project (Stanley & Greenwood, 1980).

Observers

Four individuals were responsible for the majority of the observations. Substitute observers, project staff members who had conducted observer training sessions and monitored the regular observers, filled in for reasons of sickness, make-up observations, or scheduling difficulties. The regular observers were all females who had been selected from a pool of 100 male and female respondents to an ad in a local newspaper. Two of the four selected observers had attended college for at least one year (one earned a B.A. degree). Two observers had completed a business or vocational school program.

Training of the observers in the observation system was accomplished during a 2-week period (half days) through the use of the CISSAR Observer and Trainer's Manual (Stanley & Greenwood, 1980). This was followed by two to three days of additional practice coding within actual classrooms. Training required observers to read materials and then practice coding small numbers of events through the use of a variety of media, including flashcards, overheads, and videotapes. Exercises and quizzes were presented throughout the manual. Mastery (100% correct) of the material in each unit was required before continuing in the training to the next unit. Mastery of the CISSAR system required preciseness, and automatic recall; therefore, training involved extensive drill work.

Reliability. To maintain adequate levels of interrater agreement throughout the study, meetings were held to discuss coding problems, reliability disagreements, and so on. These meetings were held semi-

monthly for the first four months of data collection and on a monthly basis after that. In addition, checks for inter-observer agreement were conducted 12 times during the study (approximately two checks per month). During these checks, two observers coded on the same target student for 15 minutes. These 15-minute periods were scheduled at different times during the school day, in different classrooms, and in different content areas. Each agreement check represented approximately 10% of a typical entire day observation. The average percentage agreement for student response across 12 checks was 95.2%, with a range of 89% to 99%.

Procedure

All observations were completed between November and May. The student's name was revealed to the classroom teacher, who was asked to respond typically during the classroom observation.

Each student was observed for one full school day (one observer following the same student all day). Observations were not conducted during breaks, such as those for lunch, recess, and bathroom. Observers did not code during physical education, music, or special assembly programs since the observation system did not apply to these situations. Observers did follow target students when they left their homerooms to go to other classrooms. Coding was conducted in these other classrooms in the same manner as in homerooms. Regardless of the physical setting, observers attempted to position themselves to be as unobtrusive as possible and to avoid revealing the identity of the target student to that student or to other students.

Data Analysis

Four composite variables were formed from the 19 coded student response variables for descriptive purposes and for analysis. Three composites were formed from the individual variables, as recommended by Stanley and Greenwood (1980):

Active Academic Responses: Writing, Playing academic game, Reading silently, Reading aloud, Talking appropriately, Asking academic questions, Answering academic questions

Management Responses: Raising hand, Looking for materials, Moving to new learning station, Playing appropriately, passive attending, waiting

Inappropriate Responses: Disruption, Playing inappropriately, Inappropriate task, Talking nonappropriately, Inappropriate locale, Looking around

In addition, since much of the literature on instructional time focuses on engagement rates (e.g., Anderson, 1984; Karweit, 1983), Academic Engaged Time was included for analysis. This variable included the seven codes that form "active academic responses," plus the "passive attending" code. For descriptive and analysis purposes, data were transformed to estimates of total minutes spent in each response. Because of the number of analyses run, a .01 probability level for significance was used.

Two types of analyses were used to test differences among categories of students (LD, EBD, EMR, NH). First, one-way analysis of variance (ANOVA) was used to compare all four groups on the dependent variable (total minutes spent in a response) over the entire school day. Second, repeated measures analysis of variance with one-between (LD, EBD, EMR) and one-within (mainstream, special education) factor

was used for a subset of handicapped students (n = 64) to test differences as a function of handicapped category and setting. Because the number of minutes spent in each setting was significantly different for the three categories of handicapped students (i.e., average time in special education setting was 47 minutes for LD students, 23 minutes for EBD students, and 135 minutes for EMR students), the repeated measures analyses used percentages of time as the dependent variables (e.g., the percentage of time in the special education setting during which the student read aloud). The repeated measures analyses were conducted for the composite variables and a selected subset of the individual student response variables.

In addition to these analyses, analyses of covariance, with time in reading as the covariate, were undertaken to clarify some of the influences of the possible confounding effects of content area (i.e., for handicapped students, reading more often occurs in the special education setting, and higher engagement rates have been documented to occur in reading rather than other content areas; see Graden, Thurlow, & Ysseldyke, 1983b). These analyses were conducted only for the four composite variables.

Results

Categorical Comparisons for Entire School Day Observations

Summary time data for the response composites and selected individual student responses over one day of observation are presented in Table 2. The results of statistical analyses also are presented.

Composite variables. None of the four composite response variables examined (active academic response, academic engaged time,

Table 2

Student Responding Times During Entire School Day
for EMR, ED, LD, and Nonhandicapped Students

Activity	Category[a] LD	ERD	EMR	NH	F Value	Sig. Level
Composites						
Active Academic Response						
X	69.83	64.39	60.47	72.76	2.31	ns
SD	22.73	20.49	20.07	15.22		
Range	25-105	37-123	31-124	40-110		
Academic Engaged Time						
X	133.69	126.90	121.15	141.62	2.58	ns
SD	31.28	32.54	28.42	28.02		
Range	66-184	63-211	72-195	82-184		
Management						
X	42.64	40.27	46.05	43.63	0.60	ns
SD	16.93	16.96	19.40	15.22		
Range	12-86	8-81	16-83	21-80		
Inappropriate						
X	37.38	46.65	37.77	30.05	2.51	ns
SD	26.83	24.87	23.79	19.46		
Range	7-141	9-108	7-112	2-87		
Individual Codes						
Writing						
X	25.17	23.91	17.75	33.17	8.73	.0000
SD	12.62	10.26	12.51	11.56		
Range	6-57	7-44	0.8-55	16-63		
Reading Silently						
X	13.43	16.44	8.79	23.39	11.34	.0000
SD	8.40	11.76	5.42	12.51		
Range	3-33	4-54	0.16-23	10-56		
Reading Aloud						
X	5.56	3.09	7.28	1.68	7.75	.0001
SD	4.75	4.68	6.89	2.38		
Range	0-20	0-25	0.66-29	0-10		
Attending						
X	63.86	62.51	60.68	68.87	0.89	ns
SD	20.35	21.04	17.30	21.60		
Range	16-100	14-115	32-91	27-110		
Looking for Materials						
X	16.17	13.17	11.79	13.17	1.94	ns
SD	8.98	6.38	6.67	6.85		
Range	5-45	2-26	2-28	4-30		
Waiting						
X	13.94	11.41	15.13	13.81	0.68	ns
SD	10.86	8.61	11.95	10.69		
Range	1-47	0.3-32	3-48	0.7-47		
Looking Around						
X	13.48	15.93	16.22	13.10	1.06	ns
SD	7.95	7.67	9.96	9.02		
Range	4-45	3-37	3-48	2-43		
Inappropriate Task						
X	2.18	3.04	3.57	2.80	0.58	ns
SD	2.48	4.80	4.39	4.39		
Range	0-9	0-20	0-15	0-21		
Inappropriate Locale						
X	4.91	5.92	4.74	2.77	0.96	ns
SD	8.04	7.74	9.24	3.41		
Range	0-40	0.1-44	0-39	0-14		

[a]Categories are: LD = learning disabled, ERD = emotionally/behaviorally disturbed, EMR = educable mentally retarded, NH = nonhandicapped

management, inappropriate), showed statistically significant differences among the categories, including nonhandicapped students, over the entire school day. In other words, there was no indication of differences during a school day among LD, EBD, EMR, and nonhandicapped students in the amount of time spent in active academic responding, or in the amount of academic engaged time. Similarly, no differences were found in time making management responses or inappropriate responses.

Selected variables. Statistically significant differences were identified only for the active academic responses; no differences were identified for any of the individual management or inappropriate responses that were examined (see Table 2). Post-hoc tests using the Student-Newman-Keuls procedure indicated that nonhandicapped students' time in writing was significantly greater than that of any category of handicapped students. EMR students also spent significantly less time writing during the school day than did students in all other categories. Nonhandicapped students' time reading silently again was greater than that of any category of handicapped students; in addition, EBD students spent more time reading silently than EMR students. Post-hoc comparisons among categories for reading aloud time indicated that EMR students spent significantly more time reading aloud than did other categories of students, including nonhandicapped students. In addition, LD students spent more time reading aloud than did nonhandicapped students.

Category and Setting Comparisons

Mean proportions of time spent making various student responses were calculated for those students who spent time in both regular and special education settings; these are listed in Table 3. In the repeated measures analysis, EMR students were divided into two groups because of significant differences in their service patterns. For some EMR students (n = 10), special education services were provided in a resource room setting, usually for less than half the school day, while for others (n = 5), special education services were provided in a self-contained class, usually for more than half the school day. The dependent measure for all analyses was proportion of time engaged in a response in the setting. The results of these analyses will be summarized in terms of the three major types of responses: academic, management, and inappropriate.

Academic responding. A significant main effect difference was found for setting between special education ($\bar{X}$ = 47%) and mainstream ($\bar{X}$ = 25%) settings in active responding time, F (1,60) = 67.99, $p < .0001$. There also was a significantly greater percentage of academic engaged time in special education settings ($\bar{X}$ = 78%) than in mainstream settings ($\bar{X}$ = 56%), F (1,60) = 71.45, $p < .0001$. No significant differences were found in either academic engaged or active academic responding time for handicapping conditions, nor were there significant setting by category interactions.

No significant differences among handicapping conditions were found for any of the academic responses tested. A significant

Table 3

Student Responding Percentage Time as a Function of Handicapping Condition and Setting[a]

	Mainstream				Special			
	LD	EBD	EMR-R	EMR-S	LD	EBD	EMR-R	EMR-S
Composites								
Active Academic Response								
X	26.4	25.7	19.1	19.9	49.3	44.8	55.0	33.7
SD	9.9	8.4	9.2	13.4	16.7	15.7	12.3	8.3
Academic Engaged Time								
X	50.9	54.1	49.5	54.4	79.3	78.4	79.8	62.2
SD	11.0	14.3	13.9	11.2	15.2	13.5	9.5	12.4
Management								
X	22.6	20.8	18.8	36.8	12.2	12.0	10.6	26.9
SD	8.2	7.8	8.0	14.2	10.5	7.4	5.3	5.1
Inappropriate								
X	18.5	25.3	3.1	8.7	8.4	9.2	9.5	10.9
SD	9.5	15.8	16.4	7.4	8.7	10.4	6.7	10.5
Individual Codes								
Writing								
X	11.9	10.2	9.7	1.8	12.3	10.2	16.5	9.7
SD	6.8	4.4	7.1	3.0	8.4	7.2	12.9	5.3
Reading Silently								
X	5.6	7.0	3.1	6.1	4.7	5.2	8.2	2.5
SD	4.3	5.6	3.4	2.5	5.5	6.1	6.3	2.5
Reading Aloud								
X	0.9	0.7	0.1	1.2	8.6	6.9	16.2	2.9
SD	1.2	0.9	0.3	0.2	10.2	10.0	8.1	2.5
Attending								
X	32.4	28.4	30.4	34.5	30.1	33.6	24.8	28.5
SD	11.9	10.9	12.5	15.5	12.6	11.6	8.2	6.1
Waiting								
X	6.9	6.6	5.7	16.1	4.7	3.6	4.4	4.0
SD	5.1	4.4	5.5	3.6	5.1	4.5	4.1	2.6
Looking for Materials								
X	9.2	7.0	3.9	6.6	3.6	4.0	3.1	8.9
SD	5.4	3.4	1.9	3.8	4.2	3.2	2.7	3.1
Looking Around								
X	7.2	8.4	11.5	6.5	3.0	4.1	5.4	3.8
SD	4.2	3.9	8.4	5.4	3.4	6.9	3.6	2.2
Inappropriate Task								
X	1.1	1.4	2.5	0.1	0.4	0.4	0.6	0.5
SD	1.1	1.8	2.2	0.2	1.2	1.1	0.8	0.6
Inappropriate Locale								
X	2.1	2.8	5.7	0.0	1.0	0.5	0.4	2.9
SD	2.9	2.9	8.0	0.0	2.7	1.1	0.8	6.0
Disruptive								
X	0.6	1.4	0.5	0.0	0.5	0.1	0.0	0.1
SD	2.2	5.4	1.6	0.0	1.8	0.2	0.0	0.1

[a]Ns for these variables are: LD = 28, EBD = 21, EMR-R = 10, EMR-S = 5. The EMR-R group includes those EMR students who received all of their special education service in the resource room. The EMR-S group includes those EMR students who received all of their special education service in the self-contained classroom.

interaction of setting and category was found for the percentage of time spent in reading aloud, F (3,60) = 3.40, $p < .01$. EMR-resource students spent more time reading aloud than any of the other groups while in special education, but did not differ from the other groups in the mainstream setting. This interaction is portrayed graphically in Figure 1. Given this interaction, the significant difference in reading aloud between settings, F (1,60) = 28.06, $p < .001$, should be interpreted with some caution. A significant main effect for setting also was found for writing, F (1,60) = 6.62, $p < .02$. There were no other significant setting by category interactions.

Management responses. Significant main effect differences were found in the amount of time students in the various handicapping conditions spent engaged in management activities, F (3,60) = 8.45, $p < .0001$. Post-hoc tests indicated that EMR students in self-contained classrooms spent a significantly greater percentage of time engaged in management activities than did students in the other three categories. There were also significant differences in the percentage of time spent engaged in management activities by setting, F (1,60) = 31.00, $p < .0001$, with a greater percentage of student response time being spent in management activities in mainstream ($\bar{X}$ = 23%) than in special settings ($\bar{X}$ = 13%). The interaction of setting and category was not significant for the management composite.

A significant setting by category effect was found in the proportion of time spent waiting, F (3,60) = 6.20, $p < .001$. Post-hoc contrasts indicated that EMR-self contained students spent a greater

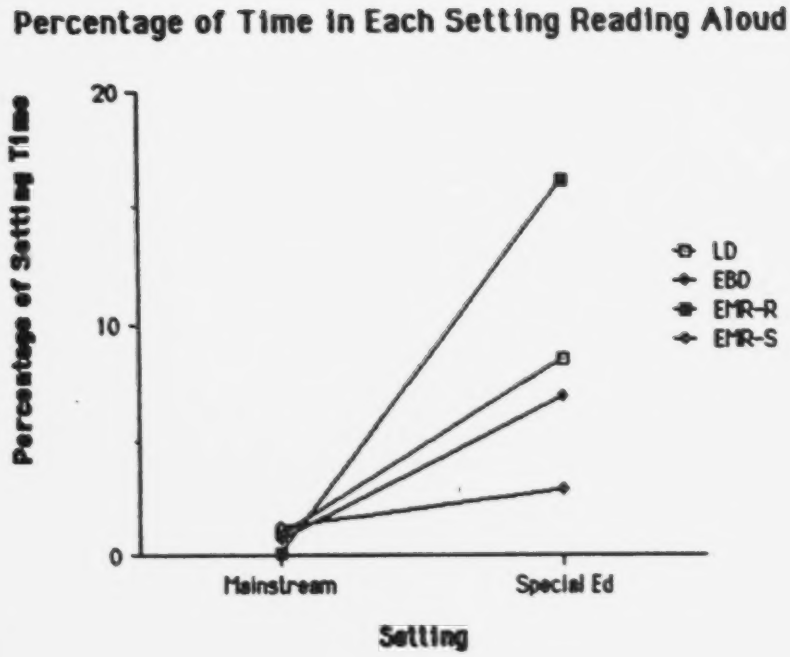

Figure 1. Time Spent in Different Settings Reading Aloud by LD, EBD, and EMR students.

percentage of time waiting in the mainstream setting than any of the other three groups, but that there were no differences between any of the groups in special settings (see Figure 2). There also was a significant setting by handicapping condition interaction in the percentage of time spent looking for materials, F (3,60) = 5.16, $p < .001$. In special settings, EMR-self contained students spent more time looking for materials than any of the other groups; in the mainstream, this difference did not exist, but LD students spent more time looking for materials than did EMR-resource students (see Figure 3).

In addition to these interaction effects, students spent a significantly greater percentage of their time waiting in the mainstream than in special settings, F (1,60) = 36.93, $p < .0001$. This global result must be viewed with caution.

Inappropriate responses. A significant setting by category interaction was found for the percentage of time students engaged in inappropriate behavior, F (1,60) = 4.05, $p < .01$. EMR students from self-contained settings engaged in significantly less inappropriate behavior than EBD and EMR-resource students while in the mainstream setting. These differences were not found in the special education setting. There was also a substantial difference in the percentage of time students engaged in inappropriate behavior in mainstream ($\bar{X}$ = 22%) versus special education ($\bar{X}$ = 9%) settings, F (1,60) = 28.17, $p < .0001$.

A similar setting by category interaction was found for percentage of time spent in an inappropriate locale, F (3,60) = 4.26,

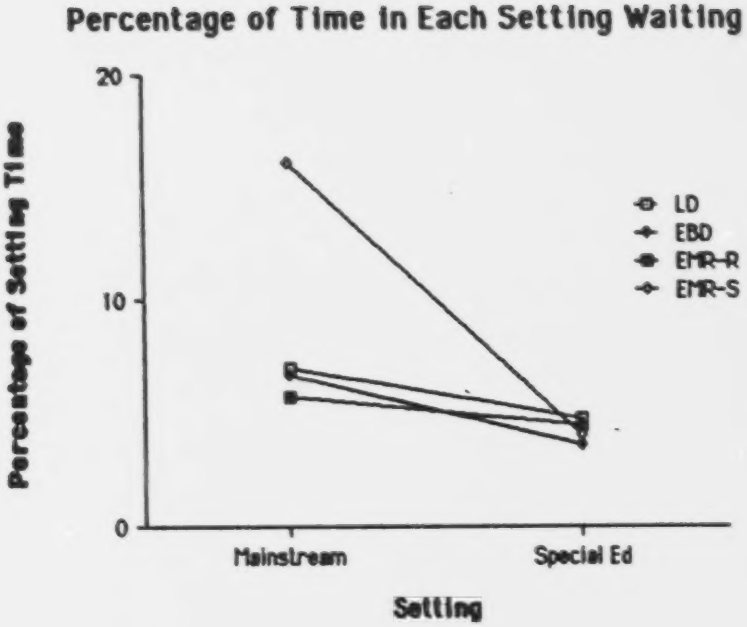

Figure 2. Time Spent in Different Settings Waiting by LD, EBD, and EMR Students.

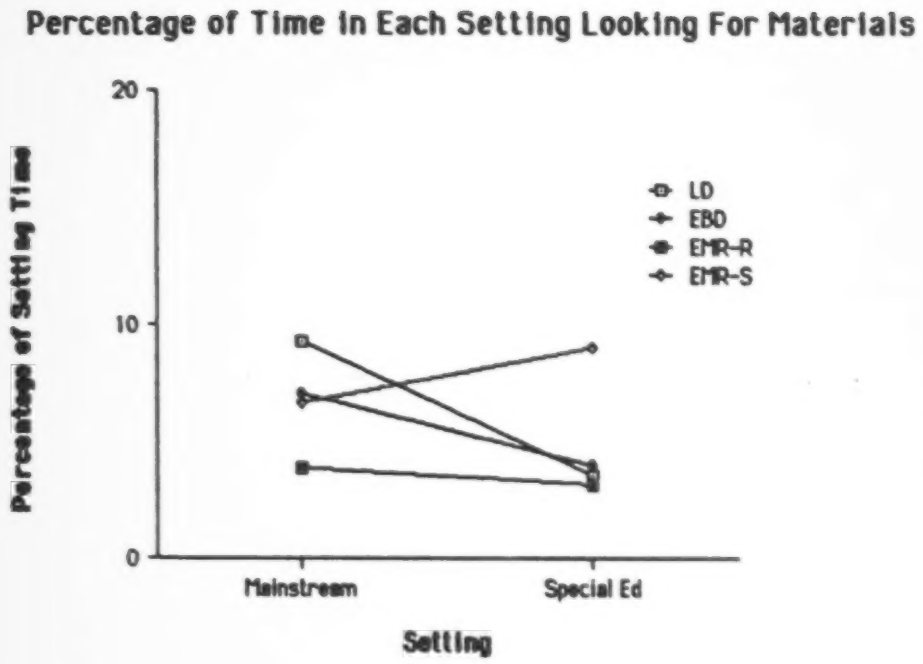

Figure 3. Time Spent in Different Settings Looking for Materials by LD, EBD, and EMR Students.

$p < .01$. EMR students from self-contained classes spent a significantly smaller percentage of time in an inappropriate locale than other students while in the mainstream setting, but a similar amount of time while in a special education setting.

Students who received services in both special and regular education spent a significantly greater percentage of time looking around in the mainstream class ($\bar{X}$ = 8%) than in special education ($\bar{X}$ = 4%), F (1,60) = 16.48, $p < .0001$. Students also were engaged in an inappropriate task for a significantly greater percentage of the time in the mainstream ($\bar{X}$ = 1%) than in special education ($\bar{X}$ = 0.4%), F (1,60) = 8.92, p = .01. There were no other significant differences by setting, and there were no differences in the proportion of inappropriate responses displayed by category.

Analyses of Covariance

Analyses of covariance were undertaken to account for the effect of reading time on student responding. Only the composite responses were included. The values of the covariate (total time in reading) are shown in Table 4 for each category. Results for the analyses are shown in Table 5. A significant category by setting interaction was found for inappropriate responding only. This interaction is displayed in Figure 4. Clearly all categories of students except EMR-S were involved for a greater percentage of time in inappropriate responding in the mainstream than in the special education setting. All setting effects were significant, with greater percentages in the special education setting for AET (78% vs. 56%) and ART (47% vs. 24%), and smaller percentages in the special education setting for

Table 4

Values of Covariate (Total Reading Time) Used in Analyses of Covariance

	Category			
	LD	EBD	EMR-R	EMR-S
Mainstream				
$\bar{X}$	39.8	52.2	40.8	5.8
SD	18.1	32.1	19.0	7.8
Special Education				
$\bar{X}$	19.0	15.9	32.3	30.2
SD	17.5	17.7	19.6	13.6

Table 5

Results of Analyses of Covariance[a]

	Dependent Variable		
Independent Variable	Category (C)	Setting (S)	C x S
Active Academic Response	ns	.01	ns
Academic Engaged Time	ns	.01	ns
Management	.01	.01	ns
Inappropriate	ns	.01	.01

[a]Covariate was total reading time in each setting (see Table 4)

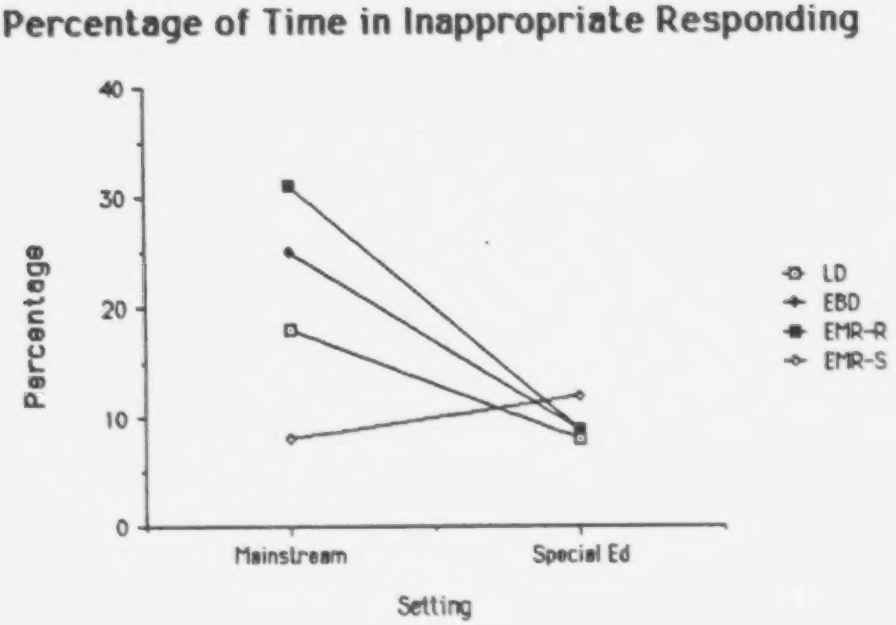

Figure 4. Time Spent in Different Settings in Inappropriate Responding by LD, EBD, and EMR Students.

management (13% vs. 22%) and inappropriate responding (9% vs. 22%). Only one category effect emerged. EMR students in self-contained classrooms engaged in management responses for a greater percentage of time (32%) than LD (17%), EBD (16%) or EMR-R (15%) students.

Discussion

During a typical school day, students engage in a variety of responses. The average amount of academic engaged time across groups was a little over two hours, about 57% of the time they were observed. The average amount of active academic responding time was a little over one hour, about 28% of observed time. These levels of academic response time are comparable to, if not slightly above, those found previously (Anderson, 1984; Karweit, 1983; Thurlow, Graden, Greener, & Ysseldyke, 1983). Management responses clearly account for a significant portion of the student's day. On the average, inappropriate responses account for about ½ hour; looking around is a primary inappropriate response that occurs. Yet, the results of this observational study indicate that over the entire school day, there are no significant differences in the array of responses made by LD, EBD, EMR, and nonhandicapped elementary students.

Analyses of handicapped students' responses as a function of handicap category and setting revealed consistent setting effects. In general, the handicapped students spent a greater proportion of their time in the special education room than of their time in the mainstream room making academic responses. The significant setting effect was found for all academic responses tested. In contrast, a

smaller proportion of class time was spent in management responses and inappropriate responses in the special education room than in the mainstream room. Of the eight analyses conducted for the management and inappropriate response composites and the selected individual codes, only one setting effect was not significant, that for passive attending. These finding, however, do not imply that mainstream time should be reduced in favor of more special education time. This conclusion is overly simplistic and ignores the documented advantages of mainstreaming (Meisel, 1986). Rather, we would argue that the findings suggest the need to identify ways in which greater academic responding time for handicapped students can be promoted in the mainstream setting.

Category differences identified by the two-way repeated measures ANOVA were few. Significant differences emerged only for the management composite, where EMR-self contained students had a greater proportion of time in management responses overall, and the "looking for materials" code, where LD students had a greater proportion of time in looking for materials than did EMR-resource students.

The five interaction effects that emerged in the two-way repeated measures analysis all were accounted for, in some way, by students in the EMR group. In two cases, the EMR-resource group was different from all others; they had a greater proportion of time in reading aloud in the special education setting, and a greater proportion of time in waiting in the mainstream. The other three interactions were accounted for by the EMR-self contained group; two involved

inappropriate responses (smaller proportion in mainstream) and one involved the management response of looking for materials (greater proportion in special education setting). While the specific implications may not be clear at this point, the results highlight the discrepancy within the EMR sample. The reasons for different service patterns and associated differences in responding patterns deserve further study.

On the other hand, the lack of the differences among categories also suggest that responding patterns provide little basis for current classification practices with mildly handicapped students. This is in accord with other observational findings on time allocated to instructional content areas (Ysseldyke, Thurlow, Christenson, & Weiss, in press), tasks used (Ysseldyke, Christenson, Thurlow, & Bakewell, 1987), and grouping arrangements (Ysseldyke, Thurlow, Christenson, & McVicar, 1987), as well as with recent findings that the match between teachers' certification categories and students' labels did not affect students' achievement outcomes (Marston, 1987).

The pervasive setting effects found in this study are not entirely consistent with previous findings in studies that attempted to compare academic responding time in mainstream and resource room settings (Thurlow, Ysseldyke et al., 1983a). Because handicapped students generally receive reading instruction in the resource room and not the mainstream classroom, and because reading time is the time when students show a greater percentage of time involved in active academic responses, attempts to compare settings are necessarily

confounded by content area. Thurlow, Ysseldyke et al. (1983) attempted to circumvent this source of confounding by comparing the handicapped students in the resource room during reading to nonhandicapped students in the regular classroom during the same time period of reading instruction. This comparison revealed no differences between the two in active academic responding time. However, the comparison rests on the assumption that active academic responding time would be the same for the handicapped student in the regular classroom during reading as it was for the nonhandicapped student.

In the present study, handicapped students received reading instruction in both the mainstream and special education settings (see Ysseldyke, Thurlow, Christenson, & Weiss, in press). In fact, both LD and ED students received the greater number of minutes of reading instruction in the regular education setting. Given this, and the previously documented differences in responding rates by subject area, it is not likely that content area is accounting for the observed differences. In fact, one would expect the results to favor the mainstream setting if academic engaged time is similar in mainstream and special education settings.

Additional research also needs to occur to document other aspects of instruction. Quantitative measures of time are not the only approach to assessing what is happening in the classroom. We must also look at a range of variables that characterize the qualitative nature of what is happening instructionally for the individual

student. Recently, Sindelar, Smith, Harriman, Hall, and Wilson (1986) have done some initial work in this area. Although they found that LD and EMR students responded differently to certain instructional events, they caution that their findings need to be replicated.

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350 Elliott Hall
University of Minnesota
75 East River Road
Minneapolis, MN 55455

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